Putting Research to Work

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Technical information for state DOT highway professionals

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WisDOT RD&T Home

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Research World

Wisconsin Project Delivery Innovation Draws Attention

Wisconsin was one of 10 states studied in an AASHTO and FHWA report, *Strategies for Reducing Highway Project Delivery Time and Cost*. The December 2003 study earned mention in the *AASHTO Journal* on Jan. 16. A notable Wisconsin innovation was allowing contractors to be compensated in money, rather than time, for utility relocation delays. See the study at http://downloads.transportation.org/Quality-FinalReport_Partnering.pdf.

Preview New Practical Papers Online

TRB's 2004 Catalog of Practical Papers is now available online. Topics are of immediate interest to transportation practitioners, such as maturity testing of concrete, effects of seasonal load restrictions, field characteristics of bituminous pavements, testing in construction, and field characteristics of earth materials. The full text of all 2004 TRB papers is available on CD-ROM through the WisDOT Library. See the Practical Papers abstracts at http://trb.org/am/ip/practical_papers.asp.

British Making Recycled Aggregate Big Business

UK treasury minister John Healey announced Jan. 27 the opening of a £1.9 million recycling plant designed to transform construction and demolition waste into highway-grade aggregates for road construction. England produces almost 100 million metric tons of such waste annually, and the new facility is intended to process 140,000 metric tons annually by late 2005. The plant's sophisticated Dutch sorting machinery was funded in large part by a governmental levy on new aggregate extraction. See http://www.letsrecycle.com/info/waste_management/news.jsp?story=2998.

Town in Yongin, Korea, Will Be Computer-Managed

Korea Land Corporation intends to build a 640,000-square-meter digital model town where all aspects of city life will be managed by a huge computer. Planners envision an intelligent transportation system with communication chips linking roads. See the article in *The Dong-A Ilbo* at http://english.donga.com/srv/service.php3?bicode=020000&biid=2004011737308. Courtesy of Transportation Communications Newsletter.

In Canada, the Winners Are…

The Canadian government has selected the projects that will be awarded contracts funded under Innovation Through Partnership, Transport Canada's ITS research and development plan. Contract proposals were submitted in several categories: urban transportation; safety, security and trade facilitation; environment; and foundations of innovation. Link to a summary of the winning projects: http://www.tc.gc.ca/mediaroom/releases/nat/2004/04-h001e.htm#bg. Courtesy of Transportation Communications Newsletter.

Designing for the Future

When the Public Speaks, Missouri DOT Listens

After early designs for a Kansas City highway interchange were criticized by local officials and the public, Missouri DOT worked to get the public involved in design revisions. The staff used strategies including telephone surveys, an advisory group and a four-month public awareness campaign that included a project Web site, humorous radio spots, billboards and computer kiosks at local shopping centers. Read more in the latest issue of MoDOT's *Pathways* magazine: http://www.modot.state.mo.us/newsandinfo/Pathways/fall2003/pdf/local_and_listening.pdf (page 3). Japanese officials visited MoDOT last month to learn about the agency's public involvement efforts: http://www.modot.state.mo.us/newsandinfo/newsreleases/january-2004/japanese1.htm.

Delaware Residents Get Out the Vote on Traffic Plans

Residents of a New Castle County, Del., street were recently asked to vote on a $75,000 plan to slow traffic in their neighborhood. After working with residents on the design and holding public hearings, Delaware DOT distributed the mail-in ballots. If the new voting program is successful, the department may use it to gauge support for other projects. Link to the story in *The News Journal:* http://www.delawareonline.com/newsjournal/local/2004/01/12publictovoteonr.html. Courtesy of Transportation Communications Newsletter.

Collaboration, Technological Innovations Mark Louisiana Highway Project

By working together and employing context-sensitive strategies, Louisiana DOT and FHWA were able to shave years off the National Environmental Policy Act review process in designing a 17-mile elevated highway traversing an endangered wetland area. The two agencies used environmentally responsible techniques including modified Cone Penetrometer Technology that allowed designers to obtain soil characterization with minimal borings. See http://environment.fhwa.dot.gov/strmlng/newsletters/jan04nl.htm, and read more in the latest issue of *Public Roads:* http://www.tfhrc.gov/pubrds/04jan/05.htm.

Cracked Bridge Girders: An Unexpected Cause

When severe vertical cracks were discovered in the prestressed girders of the Francis Case Memorial Bridge, which spans the Potomac River in Washington, D.C., engineers immediately began looking for the source. In contrast to the "more is better" philosophy, they found that atypical load cases can sometimes cause cracking when too much reinforcement is built into bridge design. Link to the article in *Public Roads:* http://www.tfhrc.gov/pubrds/03nov/03.htm.

Map Labeling Software Helps County Meet E-911 Rollout Deadline

To allow its E-911 division to implement a new tracking grid system last month, the Geomatics division of Sarasota County, N.J., generated a map book in record time with help from a new software tool. The Label-EZ and Label-Edit software from MapText, Inc., allowed the division to create 640 maps with millions of text elements in less than 6 weeks, a process that would have taken over 16 weeks with the county's existing techniques. See http://spatialnews.geocomm.com/dailynews/2004/jan/12/news2.html.

Truck Weight Increase Would Affect Bridge Service Life

Increasing the legal truck weight would make repair or replacement of many bridges in Minnesota necessary sooner, according to a recent Mn/DOT study. While prestressed concrete I-girder bridges and modern steel-girder bridges could withstand a 20% increase in truck weight, such an increase would reduce the remaining life in older steel-girder bridges by up to 42%. Link to the article in CTS Research E-News: http://www.cts.umn.edu/news/renews/2004/01/index.html#infra01. Read more about the impact of truck weight on bridge networks in this recently released NCHRP report: http://gulliver.trb.org/publications/nchrp/nchrp_rpt_495.pdf.

Construction and Materials Innovations

Milwaukee Bridge Forensics Work Cited by FHWA

The Hoan Bridge in Milwaukee is cited on FHWA's new Research and Technology page—R&T Initiatives, Structures—as an example of the use of forensic analysis to study brittle failure. The Web site provides information on FHWA's Research and Technology program initiatives in 12 priority areas and intends to serve as a forum for information sharing on technology transfer. Courtesy of the TRB E-Newsletter: http://www.fhwa.dot.gov/rnt4u/index.htm.

New Jersey Saves Big with Accelerated Construction

Accelerated construction will save New Jersey DOT nine months on a bridge improvement alongside the New Jersey Turnpike, just west of New York City. After consulting with AASHTO and FHWA, NJDOT developed a plan to use prestressed, precast high-performance concrete for a new bridge deck. With other improvements included, the bridge deck work will take 3 months and cost $3 million, comparing favorably to an original projection of 12 months and $10 million. See the January/February issue of *Focus*: http://www.tfhrc.gov/focus/jan04/03.htm.

New Deflectometer Rolling Along

Tests last summer of a newly developed rolling wheel deflectometer—used to measure the load-carrying capacity of pavement—proved successful enough to warrant further development. More a real-time gauge than traditional falling weight deflectometers, the RWD allowed scanning of 300 miles of pavement at highway speeds in just one afternoon. Other state transportation agencies are being sought to participate in testing. Read more in *Public Roads* at http://www.tfhrc.gov/pubrds/04jan/04.htm.

Virginia Rebuilds 120-Year-Old Bridge with New Steel

An interesting article in the January/February issue of *Public Roads* describes the rebuilding and restoration of a 19th-century steel-girder bridge in Virginia. Badly rusted bridge girders were replaced with new steel replicas developed by entering data into AutoCAD. Stone piers were cleaned and repointed, and the bridge again stands looking much as it must have when it was built in 1891. See http://www.tfhrc.gov/pubrds/04jan/07.htm.

New Superpave Simple Performance Testers Show Promise

Two new devices for testing dynamic modulus, flow number and flow time have been evaluated and found to meet the requirements of a performance-based purchase specification. NCHRP Report 513 describes the procurement and evaluation of the two SPTs, and the ensuing revision of the purchase specification for future procurement of production SPT units. See the report at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_513.pdf. Courtesy of the TRB E-Newsletter.

Mobile Asphalt Lab Hits Midwest

The FHWA mobile asphalt laboratory traveled to eight states last year, including Wisconsin. The lab is scheduled to reach 11 more states in 2004. In July 2003, the lab helped Iowa DOT evaluate a time-saving, simplified testing procedure for use with Superpave mixes. Another neighbor will benefit from the lab in June, when the mobile asphalt laboratory will assist Minnesota DOT with a stone-matrix asphalt installation. Read more in the latest issue of *Focus*: http://www.tfhrc.gov/focus/jan04/02.htm.

Spotlight Falls on New Geotechnical Applications

The January issue of FHWA's *R&T Transporter* includes a story surveying the latest in geotechnical applications. In summaries of two Geotechnical Engineering Circulars, the article points toward the use of shallow, several-feet-only foundations for abutments, bridge piers and retaining wall footings, and the use of steel bars to reinforce earthen walls. See the article at http://www.tfhrc.gov/trnsptr/jan04/index.htm#infra1, and download these and other circulars at http://www.fhwa.dot.gov/bridge/geopub.htm#geotechcirculars.

Operating/Optimizing the System

Seeing Crosswalks in a New Light

In-pavement warning lights, visible to approaching drivers when a pedestrian is in a crosswalk, have the potential to improve driver behavior and increase safety at crosswalks not controlled by traffic signals. FHWA is currently studying the impact of such roadway lights triggered by a push button in a variety of lighting conditions. Link to the article in *Public Roads:* http://www.tfhrc.gov/pubrds/04jan/03.htm.

Early Warning Devices to Prevent Rear-End Crashes

Just one additional second of warning could help prevent 90 percent of rear-end crashes. With this in mind, researchers at the Texas Transportation Institute are working to identify the most effective early warning devices, such as detectors, signs and message boards, for alerting drivers to stopped traffic. Link to the Texas Transportation Institute article: http://tti.tamu.edu/researcher/newsletter.asp?vol=39&issue=2&article=4.

Intersection Safety Innovations Demonstrated at New Facility

In 2002, more than 9,400 people were killed and 1.4 million injured in crashes at intersections. To prevent intersection crashes, drivers need warning systems that alert them to the potential for a collision or tell them when it is safe or unsafe to pass through an intersection. Take a look at the latest automotive innovations and intersection technologies for improving driver performance, as demonstrated at FHWA's intersection testing facility. Link to the article in *Public Roads:* http://www.tfhrc.gov/pubrds/04jan/08.htm.

Pennsylvania LTAP Offers Sign Maintenance Presentation

In cooperation with FHWA, the Pennsylvania Local Technical Assistance Program recently developed the PowerPoint presentation “Maintenance of Signs and Sign Supports for Local Roads and Streets.” The slide presentation provides an overview of best practices for installing and maintaining signs, including repairing and replacing signs, inspecting and cleaning them, and work zone traffic control. The presentation can be downloaded from the National Highway Institute’s Web site at www.nhi.fhwa.dot.gov/downaffi.asp.
Link to the article in *R&T Transporter:* http://www.tfhrc.gov/trnsptr/jan04/index.htm#train1.

High-Tech Highway Maintenance Support

FHWA recently announced the start of the 2004 field demonstration of the Maintenance Decision Support System. The MDSS is a fusion of state-of-the-art weather forecasting technologies and computerized roadway maintenance rules of practice. Output from the system includes road-specific weather forecasts and treatment recommendations for winter maintenance managers. You can monitor MDSS forecasts and treatment recommendations through March 15 by downloading software from the National Center for Atmospheric Research. See http://www.nawgits.com/fhwa/mdss_update.html.

TTI Estimates Cost of Congestion

By analyzing projected traffic demand and estimated construction funds, researchers at the Texas Transportation Institute created a model that estimates what it would cost to achieve various levels of mobility across Texas over the next 25 years. They reported that if current trends continue, the total cost of congestion in Texas will be over $182 billion. But the benefits of the improvements from less delay, fewer gallons of wasted fuel, and increased efficiencies to business and commerce are estimated to total $511 billion. Read the full report at http://www.texasgbc.org/reports2.html. Link to the Texas Transportation Institute article: http://tti.tamu.edu/researcher/newsletter.asp?vol=39&issue=2&article=3.

Safe Travel/Smart Travel

Virtual Toronto

University of Toronto researchers are building the Toronto Network, a microsimulation traffic model of metro Toronto, for use in studies of user demand impacts on traffic networks. The model will facilitate future research in maximizing road capacity with ITS technology such as ramp metering and advanced traffic assignment and rerouting. Link to the report from the University of Toronto Transportation Engineering and Planning Group: http://www.civ.utoronto.ca/sect/traeng/its/torontonet.htm.

Helping Drivers Enter Rural Intersections Safely

Minnesota's ITS Institute is developing a system to enhance drivers' ability to successfully negotiate unsignalized rural intersections where a low-volume road crosses a highway carrying high-speed traffic. The system uses radar and a nonregulatory graphic display to warn drivers of unsafe cross or merge conditions. Link to the report in *The Sensor*: http://www.its.umn.edu/sensor/2003/fall/ids.html. Courtesy of Transportation Communications Newsletter.

Big Trucks, Technology Help Montanans Do Winter

Montana DOT has beefed up its winter weather arsenal. Internet users can view data collected from the Road Weather Information System on MDT's Web site, www.mdt.state.mt.us/travinfo. The site features maps charting road conditions and Web camera pictures from 17 sites, including Bozeman Pass. MDT is also upgrading the RWIS software to page MDT officials when conditions on a particular stretch of road become hazardous. From the *Bozeman Daily Chronicle*: http://www.bozemandailychronicle.com/articles/2004/01/01/news/03roadtechbzbigs.txt. Courtesy of ITS America News.

FORETELL Information Convinces Operators to Change Decisions

In the Upper Mississippi Valley region, one-third of highway maintenance operators who used the FORETELL road weather information system changed their weather-related decisions based on information provided by the system. From the ITS Benefits and Costs Database: http://www.benefitcost.its.dot.gov/ITS/benecost.nsf/ByLink/BOTM-January2004. Courtesy of the ICDN Newsletter.

New Database Will Help Georgia DOT Analyze Incidents

A state-of-the-art database being developed by the Georgia Tech Research Institute will help GDOT analyze the most common traffic accident locations and their conditions and develop plans to reduce the 300,000 incidents—and 1,500 fatalities—occurring in Georgia each year. Link to the report on the Research Institute Web site: http://www.gtri.gatech.edu/atas/ct/proj_saferroads.html.

Improving Video Monitoring of Freeway Entrance Ramps

Researchers at the University of Minnesota's Intelligent Transportation Systems Institute are developing techniques to allow more accurate video-based monitoring of traffic flow on freeway entrance ramps. The techniques aim to improve traffic engineers' ability to manage these critical road segments. Link to the report in the CTS Research E-News: http://www.cts.umn.edu/news/renews/2004/01/index.html#its01.

FHWA Enhances Road Weather Management Site

New and improved content includes best practices and publications for all types of weather events, summaries of ongoing Road Weather Management projects, and a Road Weather Information Systems technology overview. Visit the site at http://www.fhwa.dot.gov/weather/. Courtesy of the ICDN Newsletter.